

*192
cont.*

[(i) introducing fine particles into a semiconductor layer, said fine particles being completely enclosed in the semiconductor;

(ii) etching said semiconductor layer so as to partially expose said fine particles.]--

REMARKS

The claims are 137 and 141-144, with claims 137, 141, and 144 being the independent claims. Claim 137 and 144 have been amended to better define the intended invention. Support for the amendments may be found in the specification at page 6, line 7 to the end of page 7; page 24, lines 8-12; page 29, line 4 to page 31 line 4; page 34, lines 10-15; page 43, line 1 to page 44, line 17; and in Figures 14(1)-(5), 25, and 26(1)-(5).

The Examiner rejected claims 137 and 144 as indefinite under 35 U.S.C. § 112, second paragraph for the reasons stated in the office action. Claims 137 and 144 have been amended to more clearly claim the intended process. Applicants submit that the amendments overcome the § 112 rejection, and request that it be withdrawn.

The Examiner indicated that claim 144 would be allowable if rewritten or amended to overcome the § 112 rejection. Having been so amended, Applicants submit that claim 144 is now allowable.

The Examiner rejected claim 137 under 35 U.S.C. 102(b) as anticipated by Klopfer et al. (US 3,735,186) for the reasons stated. Claims 141-143 were rejected under 35 U.S.C. § 102(b) as anticipated by van Gorkom et al. (US 4,370,797) for the reasons stated. The Examiner also rejected claims 134-137 under the judicially created doctrine of obviousness-type double patenting as being obvious over claims 1-49 of U.S. Patent 5,066,883. These rejections are respectfully traversed.

Klopfer et al. is directed to a field emission cathode comprising a glass substrate sandwiched between two electrodes with cavities extending through the sandwich. The cavities contain highly compacted porous electron emissive layers diffused with metallic gold, to form needle-shaped deposits. For example, in Figure 6 of Klopfer et al., porous alumina 9 corresponds to the insulating layer of the present invention, the needle-shaped deposits 11 correspond to the dispersed particles in the insulating layer of the present invention, and the gold residue on the surface corresponds to the partially exposed fine particles of the present invention.

The porous alumina 9 of Klopfer et al. is in contact with electrode 2 through the thin alumina layer 7, but is not in contact with electrode 4. Electrode 4 functions as a gate electrode of the field emission device. As claimed in claim 137 of the instant invention, however, the insulating layer containing the fine particles is in

contact with both electrodes 1 and 2, as depicted, for example, in Figure 14(5). Thus, the Klopfer et al. device differs from the instant process of claim 137 both in constitution of the device, and in the mechanism of its operation. Klopfer et al. can not be said to anticipate the process claimed in claim 137 of the instant invention, and Applicants request that the anticipation rejection be withdrawn. In addition, claim 137 is identical to allowable claim 144 except for the use of an insulating layer rather than a semiconductor layer.

Van Gorkom et al. is directed to a method of manufacturing a semiconductor device, employing a self-alignment process wherein an insulating layer and a conductive layer both may function as a mask, after etching. See column 5, line 29 to column 6, line 3. Importantly, the purpose of using these layers is to allow for donor or acceptor ions to be injected into the semiconductor layer. By contrast, in claims 141-143 of the present invention it is the dispersion of fine particles between the electrodes that is the goal of the instant invention. Whereas injected ions act as independent atoms in the semiconductor, the dispersed fine particles of the instant invention are bulky in nature and do not act as individual atoms. See specification at page 36, line 11 (fine particle diameter ranges from 100 to 1,000 angstroms). Such fine particles are also incapable of acting as donor or acceptor ions, as in van Gorkom et al. Thus, van Gorkom et al. can not be said to anticipate the

process claimed in claims 141-143 of the instant invention, and Applicants request that the anticipation rejection be withdrawn.

The remaining rejection is the double-patenting rejection of claim 137 (claims 134-136 having been canceled) over claims 1-49 of the '883 patent issued in a parent case of this application. The Examiner noted with particularity claims 1, 9, 16, 37-46, and 48.

Claim 137 is directed to a method employing three discrete steps: (1) forming electrodes opposed to each other on a substrate; (2) forming between the electrodes an insulating layer in which fine particles are completely enclosed; and (3) etching the insulating layer so as to partially expose the fine particles.

The claims of the '883 patent are not directed to a method; they are directed to a product. In the parent application 07/218,803, which issued as the '883 patent, there was a restriction requirement. It is understood that method claims corresponding to the instant claims were canceled. Likewise, in related application 07/705,720, there was a restriction requirement in paper no. 6 dated March 23, 1992 in which the product claims (claims 67-132), generally corresponding to the issued claims of the '883 patent, were restricted out from the instant method claims of Group III claims 134-137 and 141-144. Therefore, the Patent and Trademark Office has already determined that the instant method claims are patentably distinct from the device claims

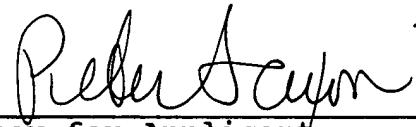
and can not now reject the instant claims as a double patenting of the issued product claims.

Furthermore, claims 1, 9, and 16 of the '883 patent fail to claim at least two elements of amended claim 137: the element of fine particles completely enclosed within the insulating layer; and the etching of the insulating layer to partially expose the fine particles. All of claims 37-46 and 48 of the '883 patent fail to recite the instant etching step. The remaining product claims of the '883 patent do not claim any of the key steps of the instant method claims. Double patenting does not depend on what is "disclosed" in a claim; it depends only on what is, in fact, claimed as a whole. The product claims of the '883 patent fail to claim any of the instant method steps. Therefore, the '883 patent can not be said to claim the elements of claim 137, and Applicants respectfully request that this rejection be withdrawn.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 758-2400. All

correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Attorney for Applicant

Registration No. 26/947

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
Facsimile: (212) 758-2982